

(Demo) Annual Narrative



FWSANV-0176

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UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
Washington, D. C.

Memo No. 57

July 5, 1938.

MEMORANDUM TO REGIONAL DIRECTORS
AND REFUGE MANAGERS

Although most of you undoubtedly realize the necessity for submitting a report covering the activities on your refuge for the past fiscal year, it is thought advisable to call your attention to the fact that this report should be in the Washington office not later than August 1, 1938.

Division Memo No. 43, dated July 15, 1937, sets forth certain items which we suggested be included in your last year's annual report. It is our desire that the same form be used in the report for the year ended June 30, 1938. Since some of you did not receive a copy of this memorandum, the suggested form is here repeated:

1. Complete information on wildlife using the area (whether nesting, wintering, or migrating). This should deal most particularly with waterfowl and upland game conditions, varieties, numbers, etc.; but mammals and other types of birds should not be overlooked. Exceptional concentrations of wildlife should be mentioned, as well as species using the refuge for the first time.

② Use made of refuge. The use made of nesting islands, shelters, ponds, artificial nests and structures, etc., by various birds and mammals should be described. A paragraph or two should also be devoted to the use made of the refuge by haying and grazing permittees, campers, fishermen, hunters (on those refuges having open areas), etc. Try to give an accurate estimate of man-days' recreational use.

③ Plantings. Summarize the planting of trees, shrubs, feed crops, aquatic seeds and tubers, etc., giving the quantities of each planted.

4. Predator control. Submit a paragraph or two on activities undertaken on the refuge toward controlling various types of predatory animals and birds, giving numbers taken.

⑤ Refuge improvements made during fiscal year. Summarize the physical improvements made on the refuge during the year, indicating which were done under regular funds and which by CCC, WPA, or other allotments.

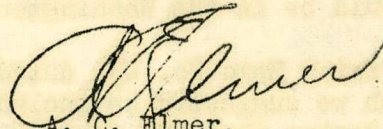
6. Scientific progress. A statement of special problems or experiments undertaken by refuge personnel, with a brief summary of results.

7. Law enforcement. A brief statement as to apprehension of refuge violators and disposition of cases.

⑧ Water conditions. A general statement as to the water conditions on the various units within the refuge.

9. Any other pertinent and interesting information concerning the refuge which may occur to you should be included. *For copying Public Relations*

Every effort should be made to have this report in the Washington office not later than August 1.



A. C. Elmer,
Acting Chief,
Division of Wildlife Refuges.

AM - Reports
Annual F. Y. 1938

Malheur Refuge
Burns, Oregon
July 21, 1938

Regional Director
U. S. Biological Survey
404 U. S. Court House
Portland, Oregon

Dear Mr. Rush:

We are transmitting herewith in duplicate the annual report of activities on Malheur Migratory Waterfowl Refuge.

If the report is satisfactory to you, please initial it and forward the original to Washington.

Yours very truly,

J. C. Scharff
Refuge Manager

FA
Enc:
cc: Attached



USE OF MALHEUR REFUGE AREA BY WILDLIFE ON INCREASE

Fiscal Year 1938, as far as Malheur Refuge was concerned, showed no sensational increases in wildlife species or in numbers of each species, however, based upon our observations, we believe that it was apparent that a steady normal gain was made in all species using this area--both as to numbers of migrant and resident birds and as to game mammals.

The southward migration of 1937 indicated a greater number of all species using the area for feeding and resting purposes than for many previous autumns, but an estimate of the approximate increase in each species of migratory birds would be mere guess and of no great value. It has been our experience that factual data concerning migratory wildfowl is procurable with much greater ease and accuracy during spring rather than during autumn migrations, since no doubt many concentrations of birds miss the Malheur Refuge entirely in the fall flight, or touch here only briefly, because of an abundance of food throughout the flyway, while in spring, we believe, the Malheur is visited by a more representative cross-section of the migration because of lack of desirable food and resting facilities elsewhere. Also, in spring periods, any change in wildlife population is much more noticeable in this area due to it being almost devoid of wildlife activity during the usual winter period.

Every effort was put forth by Refuge personnel in the spring of 1938 to ascertain, if possible, the facts concerning first arrivals of all species, and we believe we were successful in securing fairly complete data.

The chart presentation shown on the following pages is based on observations made on Malheur Refuge, and the quantity of each species was in some cases gained by actual count, while in other instances, of course, it was necessary to estimate as closely as possible--using the method commonly prescribed for use in estimating migratory waterfowl in flight.

Following herein will be noted our observations on first arrivals--both migrants which use the Malheur Refuge for nesting and others which passed through enroute farther north:

First-Noted Arrivals of Migratory Birds

at

Malheur Refuge

Spring of 1938

Species	First Flight Observed		Second Observation	
	Date Noted	Number Species	Date Noted	Number Species
* Canada Goose	2/25/38	2	3/10/38	4,000
White-fronted Goose	2/18/38	50	2/28/38	200
Snow Goose	2/18/38	500	2/28/38	5,000
* Mallard	2/18/38	300	3/10/38	700
* Pintail	2/18/38	200	2/28/38	3,000
* Baldpate	2/18/38	100	2/28/38	50
* Redhead	3/10/38	5	3/25/38	3
* Green-winged Teal	2/18/38	6	3/30/38	1,000
* Cinnamon Teal	3/10/38	3	4/10/38	500
* Blue-winged Teal	4/10/38	2	6/3/38	8
* Canvasback	3/18/38	10	3/29/38	14
* Ruddy Duck	3/7/38	1	4/10/38	10
* Lesser Scaup	3/18/38	7	4/10/38	300
* Shoveller	3/18/38	20	4/7/38	500
* Gadwall	3/30/38	30	4/6/38	100
Bufflehead	3/14/38	10	4/10/38	6
Goldeneye	3/14/38	12	3/30/38	7
Whistling Swan	3/10/38	125	3/30/38	300
* Wilson Snipe	3/18/38	1	4/6/38	1
* Sandhill Crane	2/28/38	2	3/1/38	2
* Killdeer	3/14/38	20	Commonly seen thereafter	
* White Pelican	4/30/38	20	4/22/38	50
* Blue Heron	4/11/38	20	4/30/38	30
* Northern Curlew	4/11/38	4	4/13/38	10
* American Bittern	4/12/38	2	4/28/38	1
* American Egret	4/13/38	1	4/30/38	8
* Western Grebe	4/14/38	1	4/30/38	2
* Pied-billed Grebe	4/28/38	30	4/30/38	50
* Western Willett	4/21/38	2		
* Eared Grebe	4/28/38	100	4/30/38	500
* Black Tern	4/29/38	6		
* Virginia Rail	4/29/38	1		
* Caspian Tern	4/29/38	1		
* Forster's Tern	5/6/38	6		
* White-faced Glossy Ibis	5/13/38	6		
* Black-crowned Night Heron	4/3/38	1	4/10/38	8
* American Coot	3/17/38	2	3/30/38	50
* Farallon Cormorant	4/28/38	2		

* Nesting on Malheur Refuge in 1938.

Mass arrivals at Malheur Refuge somewhat later were noted as follows:

<u>Species</u>	<u>Date</u>	<u>Approx. Number</u>
Canada Goose	4/30/38	4,000
White-fronted Goose	3/14/38	4,000
Snow Goose	3/30/38	25,000
Mallard	3/30/38	5,000
Pintail	3/14/38	8,000
Baldpate	4/10/38	300
Redhead	4/10/38	100
Greenwinged Teal	4/10/38	2,000
Shoveller	4/10/38	600

As indicated by the weather chart shown herein on a later page, the winter of 1937-38 was comparatively mild, however, beyond a certain point, intensity of winter makes little difference in our winter waterfowl population. Each fall and well into the winter, one may observe a fair representation of many different species of waterfowl until the usual severe January weather arrives, when only a remnant of but a few species may be seen. Winter population noted on Malheur Refuge during the annual waterfowl estimate on January 17, 18, 19, 1938, was as follows:

<u>Species</u>	<u>Approx. Number</u>
Mallard	400
Baldpate	50
Green-winged Teal	50
Lesser Scaup	50
Canada Goose	1750

It must be remembered that the importance of the Malheur area is to be rated on the basis of breeding, resting, nesting, and summer feeding use, rather than on the basis of winter accommodations..

For the first time, we believe, we are able to report that Lesser Scaup ducks are nesting on Malheur Refuge. Our report is based on one nest and four broods of young noted subsequent to July 1, 1938.

Canvasback ducks, first reported as nesting on Malheur Refuge during 1937, have assumed a position of nesting importance here in 1938 when 11 nests and two broods of young were recorded

prior to June 30, 1938, and subsequent to that date many other broods of young canvasbacks were noted, leading us to believe that considerable nesting use is being made of Malheur by this species.

With the most water in more than 10 years from the Blitzen River watershed during spring and summer of 1938, as explained herein under the section on water conditions, thousands of additional acres of excellent nesting area on the Refuge were made available to the waterfowl and shore birds. The water area in the Blitzen Valley was increased in the aggregate only by approximately five thousand acres over the area of the previous year, inasmuch as it was necessary to keep several areas dry for constructional purposes, but in the Malheur Lake unit, the total water area was extended to approximately 28,500 acres, or about double the water area of a year previous.

This additional expanse of water and shore line on Malheur Lake, made excellent nesting conditions for the following marsh-loving birds in addition to the ducks and geese using the area:

Western Grebe	Western Least Bittern
Bared Grebe	Glossy Ibis
Pied-billed Grebe	Virginia Rail
Black-crowned Night Heron	Sora Rail
Northern Curlew	Killdeer
Avocet	Wilson Snipe
Wilson Phalarope	Spotted Sandpiper
Western Willett	California Gull
Treganza's Heron	Ring-billed Gull
American Egret	Forster's Tern
American Bittern	Caspian Tern
White Pelican	Black Tern
Black-necked Stilt	
American Coot	

Including the 13 species of ducks which nest on Malheur Refuge, namely,

Mallard	Gadwall
Cinnamon Teal	Baldpate
Green-winged Teal	Pintail
Blue-winged Teal	Ruddy Duck
Shoveller	Redhead
Canvasback	Am. Merganser
	Lesser Scaup,

and the Canada Goose, this area has recorded not less than 117 species of nesting birds, with a grand total of more than two hundred resident and migrant species recorded here.

The nesting and brood charts shown on the following two pages were compiled from information gained from scientific investigation, however, the information shown in each should not be used as a basis for final conclusive findings, since, we believe neither chart to be sufficiently comprehensive for such use.

As a result of studies being carried on at Malheur Refuge at this time, it is hoped that much more conclusive data than herein presented will be available in the near future, and it is our thought that the recordings herein relative to nesting and brood conditions encompass too small a percentage of the total waterfowl population to be used as final information.

**POOR
QUALITY
ORIGINAL**

SURVEY OF DUCK BROODS
IN
MILWAUKEE METROPOLITAN WATERFOWL RESERVE

During June and July 1937.

(Number of Broods - Average per brood)
= Number of Young

for
(Number of Broods Shown)

SPECIES	No. of Broods	Average per brood	No. of Young
Mallard	112	8.2	976
Canada	56	7.9	437
Redhead	19	6.7	129
Ring-necked	22	8.5	187
Pintail	34	9.0	306
Cinnamon Teal	35	8.3	293
Blushing Teal	7	9.0	63
Ruddy	5	7.6	38
Green-wing Teal	1	11.0	11
Unidentified Broods	3	12.3	37
TOTAL	300	8.5	2470

Waterfowl Nesting Data -- Malheur Refuge
Period of April to June 30, 1938

Species	Number of Nests Observed By Units of Refuge Area							Total Nests Studied	Average No. Eggs Per Nest	Remarks
	1	2	3	4	5	6	7			
Mallard	0	12	29	7	0	62	9	132	9.45	
Pintail	5	2	1	2	0	8	5	24	7.0	
Gadwall	6	1	0	4	0	12	10	42	7.75	
Shoveller	1	1	0	1	0	3	1	7	6.71	
Cin. Teal	5	5	0	2	0	32	0	48	7.67	Some may have been Blue-winged Teal
Baldpate	0	0	0	0	0	0	1	1	8.0	
Ruddy Duck	0	0	0	0	0	3	0	3	8.0	
Redhead	0	1	0	1	0	5	6	13	8.33	
Canvasback	0	1	0	1	0	8	1	11	9.54	
Other Ducks	1	6	0	1	0	13	4	25	5.4	Observed but not identified
Canada Goose	3	17	18	2	73	59	113	9* 275	4.59	* Located on Rimrocks

Note: Compiled from nesting studies conducted by Junior Biologist of Wildlife Research Division.
 (Above figures not conclusive as to species nor averages since study continued after July 1, 1938.)

Upland Game Conditions:

As stated in Malheur Refuge Annual Report for fiscal year 1937, our resident quail and grouse population was evidently wholly exterminated in the severe winter of 1936-37, and since that time no evidence has been found on the Refuge to show the presence of either of these birds.

Sage Hens were believed to have had a normal increase in numbers through breeding this spring, however, the seclusive habits of this species makes difficult any attempt to ascertain the absolute facts relative to their numbers. Scattered pairs of these interesting birds were noted throughout the past year at many different places on the Refuge.

Our Ring-necked Pheasant population has been steadily increasing, although conditions are not entirely to their liking. It is estimated that our 50 pairs of last year have increased to at least 75 pairs by this writing. Undoubtedly, the mortality rate in the ranks of this pheasant is quite high due to predators of several kinds, and due to lack of proper wintering facilities. In an attempt to provide fall and winter feed for the ring-necked flock in the P Ranch area, we seeded approximately three acres of barley in 1937 in a select location, but a host of blackbirds invaded the field just prior to harvest time and as a result the grain left for winter use was very little.

European Partridges were in evidence during all seasons of the past year, but evidently this species is no more than holding its own as to numbers, since only a few birds have been noted each time, with no concentrations apparent at any time.

Big Game Mammals on Refuge:

In order to compile a cooperative report for the Oregon Research Unit at Corvallis, personnel of this Refuge made every effort to count and classify any and all Mule Deer and Antelope seen on this area during the period of July 1, 1937 to January 31, 1938, with the following results:

<u>Species</u>	<u>Males</u>	<u>Females</u>	<u>Fawn</u>	<u>Uncl.</u>
Mule Deer	29	58	32	26
Antelope	1	1		32

The foregoing list by no means should be interpreted as a criteria of our deer and antelope population, but is listed

herein purely for informational purposes. This vast area of approximately 65,000 acres in the Blitzen Valley is habited intermittently throughout the year by many hundreds of mule deer and not less than several hundred antelope, but due to the dense, high cover it is only occasional that actual sight of either of these game mammals is possible.

The Steens Mountains country, lying just east and south of the Blitzen Valley unit, offers one of the best deer and antelope ranges for spring, summer and fall use, in the State while the favorable location of the Refuge offers excellent wintering facilities.

VARIED USES MADE OF MALHEUR REFUGE IN FISCAL YEAR 1938

The general topography of the Malheur Refuge area lends itself to developments in such a way that after the water control structures are installed, no islands or other artificial nesting facilities are necessary to stimulate nesting occupancy of the area by waterfowl. Once the water reaches its proper level, a desirable habitat is created. This is evidenced by the increasing numbers of nesting waterfowl and the recording of new species making nesting use of the area from year to year since the beginning of the development work.

A number of small rafts were anchored in open water in Unit 8, during the winter of 1937-38. A covering of mud and tules was applied to each raft, and we were interested to know the use, if any, that would be made by nesting waterfowl of these islands. Spring nesting observations showed that several pairs of Canada Geese and one coot located nests on these structures. In all probability, increased use will be made of the islands in the future since by next season they will have become a permanent part of the landscape. It was our thought to provide this limited number of nesting structures for experimental observation purposes, inasmuch as many other desirable places exist nearby for every pair of nesting birds desiring such facilities.

Approximately 34,000 animal months grazing use was made of the Blitzen Valley and 7,140 tons of hay cut and stacked or bunched during the harvest season of fiscal year 1938. In addition to this use, \$2,273.60 was received from permits of a miscellaneous nature on lands and improvements within the Refuge proper, and from scattered tracts owned by the Refuge, but lying at some distance from the Blitzen Valley boundary.

The Squaw Butte Grazing Experiment Station wintered 103 head of cattle in Unit 8, in the beginning one-half the herd was placed on bunched hay and the balance of the herd made to use uncultivated meadow pasture. With the advent of January, it was necessary to move the portion of the herd which was on pasture in with the cattle on bunched hay since it was apparent that the pasture feeding was producing a noticeable shrinkage in the condition of the pasture animals.

Beginning as of April 1, the major permits of the Refuge were issued for a five year term which will have a stabilizing effect upon the Refuge permit business, as well as aiding in stabilizing the local livestock industry.

At the end of the 1938 fiscal year, indications are that Harney County will produce a large surplus of feed this season, and it is more than possible that a portion of the Refuge will remain unutilized at the close of the grazing season.

During the 1937 season, use was made of all areas open to grazing in the Blitzen Valley, but in no instance was over-utilization in evidence in any unit. The use concession granted the E. O. L. S. Co. in the Blitzen Valley purchase contract, terminated as of March 31, 1938, and when once this area is placed under permit, an increased grazing revenue may be expected. However, in all probability, it will require several seasons to find a desirable permittee for this area since the average cattle operator is unable to utilize the amount of feed produced on this unit. If possible, this whole area should be under one permit as the improvements center around the middle of the area and the best possible use of the area is possible only when operated as a unit.

The Malheur Lake Division, including some 54,000 acres, is under Permit Administration of a Court Receiver. The money taken in from permits issued within this unit is being held in escrow pending the outcome of the suit between the United States and riparian and squatter claimants to quiet title to the lands below the Heal Survey line and abutting to lands privately owned which adjoin the meander line.

As of June 30, 1938, information from the Court Receiver indicated that approximately \$5,000 has been accumulated by the Court, and permits are already issued for the 1938 use of the area. Approximately 200 acres of grain has been seeded within the Lake unit by permittees--this amount is perhaps ninety percent less than the acreage which should be sown annually. It appears that the present Receivership arrangement will endure for some time in the future as the suit has been and will undoubtedly be postponed from time to time.

Recreational Uses:

Owing to mosquitos and other insect pests present during the usual camping season, there is only a limited camping use made of the Refuge. Provision has been made to satisfactorily take care of the needs in this respect, but we cannot expect much increase in the number of campers for many years to come.

Fishermen are more numerous since good fishing under permit is available on the Refuge. This season, the Blitzen River has been fished rather heavily and almost every fisherman has reported successful results. We believe the excellent fishing of 1938 is a direct result of the stocking of the stream by the State Game Commission in 1937. Fish planting activities should be encouraged since there are about eleven miles of good fishing water open to fishing under permit within the Refuge, and more than eighty miles of equally good open water adjacent to the Refuge on the same streams.

It is estimated that there was a total of 250 man days fishing and camping use made of the Refuge, and approximately the same number of picnicing man days in fiscal year 1938.

The Malheur Refuge has no area open to hunting.

PLANTINGS MADE ON MALHEUR REFUGE FISCAL YEAR 1938

The severe frost which occurred in August 1937 reduced the grain crop in the Blitzen Valley considerably. An area which produced almost six thousand bushels of grain in 1936, netted a scant two thousand bushels in 1937. A fair amount of aftermath feed for the birds was available on the grain areas after harvest. Approximately four hundred acres of grain have been seeded within the Blitzen Valley in 1938, and present indications bespeak of a bumper crop. As insurance against the uncertainty of grain growing in the Valley, we hope to build up a two year seed supply this season. It is also the desire of the Refuge administration to substantially increase the grain acreage, since the fall migration of birds may make use of a large amount of such food if provided. During the fall migration we believe it desirable to hold the birds here until adverse weather arrives and provide ample food to carry them through their stay in order to place them in shape to continue the journey southward in good physical condition.

The P Ranch nursery is being continued with fair results. Meadow mice continue to be a serious problem, particularly during the winter months. Practically all the conifers which were placed in the nursery have succumbed to the rigorous weather and other adverse conditions.

At the present time we have tree plantings on hand sufficient to meet local needs. Included in this stock are the following:

1200 Black Locust	300 Yellow Willows
1000 Carolina Poplar	50 Chinese Elm
10 Caragana	300 Hawthorne

as well as a limited number of the more vigorous coniferous trees. Plantings about the Refuge headquarters' grounds have been placed and with minor exceptions growth has been excellent. A limited amount of winter kill and bug damage occurred, but replacements have been made and pleasing results are assured.

During the past year 14 bushels of bayonet grass, 14 bushels of Sage Pond Weed, one bushel of smartweed, and four and one-half bushels of wild millet seed have been planted. An abundance of aquatic food is available for waterfowl through the Refuge. Sage pond weed has made such extensive growth that it is virtually impossible to propel a boat on Malheur Lake with an outboard motor since the propeller invariably becomes entangled in the hairy growth in a movement of a few feet. This same food plant is abundant throughout the entire Blitzen Valley even on ponds which received water for the first time this year.

A total of 11,764 trees and willows have been planted for ornamental and windbreak purposes, as well as for dyke protection the past year.

PREDATOR CONTROL ACTIVITIES ON MALHEUR REFUGE

Refuge personnel during the past year, incidental to their regular duties, accounted for 16 coyotes either shot or trapped, of which scalp was taken.

The Division of Predator and Rodent Control has maintained a trapper on and adjacent to the Refuge in Harney County at all times during the past year and we believe he has taken more than two hundred coyotes and cats.

Seventy-seven Ravens, 14 Crows, and 117 Magpies, were killed in June 1938 by Malheur Refuge personnel. The experimental

poisoning campaign carried on in 1937 and 1938 against magpies and ravens, plus continuous efforts whenever possible to reduce raven numbers by gunshot, has lowered our raven and magpie population noticeably, however, other factors have perhaps played a part in this decrease. One such factor may have been the decline in food for the ravens during other than nesting seasons. The California Jackrabbit, which was so numerous in 1935 and 1936, has been really quite scarce in 1937 and 1938 due either to disease or winter conditions, or perhaps to both. Prior to this reduction in rabbit numbers, sufficient of these mammals were killed by automobiles to keep a good many ravens in food throughout the year.

REFUGE IMPROVEMENTS ON MALHEUR DIVERSIFIED

The improvement program on this Refuge during the year being reported has covered many different activities. Odd jobs were completed on the headquarters group of buildings and the P Ranch renovation project was completed, while substantial improvements were made on the Witzel Patrol station buildings. The major building job of the year covered the Frenchglen Hotel which was rehabilitated. CCC funds were utilized on all construction work except for \$834 of Symbol 55 money which was spent on the Frenchglen Hotel, and \$216 which was expended for the drilling of a well at the Witzel Patrol station.

In addition to the foregoing, the following improvements were made:

<u>Type of Improvement</u>	<u>Quantity</u>
Lookout Tower construction	1 each
Vehicle Bridges constructed	9 each
Fences, 5 strand barbwire	30,109 rods
Water recording station	1 each
Guard Rails	20 rods
Levees & Dykes	107,000 cu. yds.
Telephone Lines	42.2 miles
Signs, Markers,	291 each
Cattle Guards	3 each
Corrals	1 each
Stone Walls	7 rods
Truck Trails	40.7 miles
Crushing Stone	2,865 tons
Cleaning Channels	9,124 sq. yds.
Riprap, brush	7,980 sq. yds.
Riprap, rock	2,697 sq. yds.
Water Control Structures	53 each
Earth Excavated	557,379 cu. yds.
Stone excavated	9,928 cu. yds.
Marking boundaries	13 miles

The accomplishments of the CCC on Malheur Refuge included, in addition to the foregoing listed improvements, a large amount of work on razing undesirable structures and general cleanup work, which is a part of the well-rounded program. A total of 9094 CCC man days were devoted to maintenance of existing improvements.

SCIENTIFIC PROGRESS RECORDED IN PAST YEAR

In cooperation with the U. S. Weather Bureau, the Refuge maintained a weather station at Sod House Headquarters where maximum and minimum temperatures were recorded and precipitation records made each day. The following summary chart of recordings at this station is presented for informational use:

Sod House Weather Bureau Station				
Weather Data--Fiscal Year 1938--Summary				
Month	Total Inches Precipitation During Month	(Fahrenheit) Maximum Temperature	(Fahrenheit) Minimum Temperature	Inches Total Snowfall
1937				
July	.01	98	56	
August	Trace	96	50	
September	.12	94	21	
October	1.46	78	24	
November	.72	62	17	
December	1.07	57	13	
1938				
January	1.37	53	5	7.7
February	.80	48	-4	17.96
March	1.28	55	10	melted as fell
April	.52	77	19	
May	.63	86	25	
June	1.42	87	31	
Total Precip.	9.40			
Max. Temperature		98		
Min. Temperature			-4	
Total Snowfall				24.96"

Bird banding operations were continued at the Malheur Refuge in the autumn of 1937, with a total of 6,561 individuals being banded. The following schedule shows the individual birds of each species banded:

<u>Species</u>	<u>Number</u>	<u>Species</u>	<u>Number</u>
Green-winged Teal	3,229	Ringneck Duck	24
Pintail	1,457	Canvasback-	19
Mallard	917	Lesser Scaup	17
Gadwall	241	Blue-winged Teal	7
Redhead	225	Wood Duck	7
Baldpate	204	Greater Scaup	2
Coot	142	Ruddy Duck	2
Shoveller	36	Bufflehead	1
Cinnamon Teal	29	Marsh Hawk	2

Spring banding was very slight due to the wide expanse of water and food on the area and it was impossible to trap many birds.

LAW ENFORCEMENT BY REFUGE PERSONNEL

An adequate patrol has been maintained of the Refuge area at all times and trespass cattle continues to be our major problem. The three range riders assigned to this area have been engaged the major portion of the time either on patrol or on regular maintenance problems. The continuance of adequate patrol on both the Blitzen Valley and Malheur Lake units is the only insurance against the former disregard for Refuge property which was so prevalent in the early stages of Malheur's development. The Lake area presents a problem in itself and the least, we believe, that should be done is to adequately patrol against trespass and violation of Refuge regulations.

Two hunters were apprehended in November 1937 for illegal possession of a canvasback duck. The case was fully reported to the Regional Office and in view of the circumstances involved, admonishments only were given the violators when they were released.

MALHEUR REFUGE SHOWS BIG GAIN IN WATER CONDITIONS

During the early part of the year being reported, the water received was short of what may be considered normal. Silvies River water did not reach Malheur Lake and water from the Blitzen was insufficient to satisfactorily maintain as many ponds in the Valley as desired and at the same time keep a steady flow into Lake Malheur. Although considerable gain was made in the Lake area over the previous season and now areas were flooded in the Blitzen Valley, it was a problem to secure the maximum use of the available water during the heavy evaporation period.

Early fall of 1937 eased the situation somewhat when a rainfall of approximately one and one-half inches of precipitation was received along with cooler weather, both of which offset the tremendous evaporation and the buildup of the Lake area again was started. The rains continued throughout the winter and the mild weather which prevailed during the entire winter allowed a continuous flow of water into the Lake with a more noticeable gain in water level than at any time since the lake was dry in 1934.

Late winter months saw the recording of very favorable snowfalls on both the Silvies and Blitzen watersheds. The Silvies River reached an early flood stage which remained a sufficient length of time to deposit several thousand acre feet of water into Lake Malheur, while the Blitzen River did not at any time reach an extreme flood stage. We did, however, have three distinct runoff periods which more nearly approached what is considered normal than any spring runoff season for the past ten or twelve years. The first runoff occurred early in February from the lowlands and the usually dry draws--the streams heading in the high country remaining comparatively clear. The second run-off came from the foothills and the third from the high mountains. The latter flow held on late into the summer season with sufficient snow remaining at the high elevations to insure a steady flow throughout the entire summer season. All of the Blitzen Valley units received water early and were ready for the earlier nesting species of waterfowl.

As reported last year, two snow courses were established on the Blitzen Watershed in cooperation with the Bureau of Agricultural Engineering. During the winter a complete water recording station was installed above the Page diversion dam. Continuous stage recordings were made with periodic water flow readings and the data thus secured published in cooperation with the U. S. Geological Survey. Readings were also taken on Bridge

Creek, which is the major source of water, other than the Blitzen, in the upper Valley.

A snow reading taken on April 10, 1938, at the 7,000' elevation, showed an average snow depth of 48.8", with water content of 16.6". On this basis a prediction was made that the Blitzen watershed would produce 100,000 acre feet of water. Actual recordings up to June 30, 1938, at the Blitzen Gorge gauging station showed a flow of 95,000 acre feet from this source, while 9,000 acre feet of water was recorded on Bridge Creek up to the same time. Although the forecast made as noted above may have been a lucky guess, we believe that on the same basis over a period of years, we will be enabled to work out a fairly dependable water management plan for each run-off, using the forecast as our guide.

Water recording stations are planned for Bridge Creek and for the mouth of the Blitzen River. These stations will be constructed this season for use in 1939.

For the first time in many years, Silver Creek and Jack Creek flowed into Harney Lake, in 1938. At the peak Silver Creek was running 284 second feet of water into the Lake. Although considerable water reached Harney Lake, it was insufficient to result in much benefit to the waterfowl, inasmuch as the evaporation was rapid and no cover was available for nesting birds. A limited area for feeding and resting was available for a short time.

As previously stated herein, Malheur Lake made a very pleasing gain in water level, with measurements taken at intervals showing more than a foot and one-half rise in the level of the Lake. The readings as made, follow:

<u>Date</u>	<u>Water Level</u>
March 9, 1938	4091.12
March 26, 1938	4091.50
April 25, 1938	4091.84
July 14, 1938	4092.70

Favorable climatic conditions have prevailed with cool nights, considerable cloudy weather, and heavy showers, during much of the early summer of 1938, thereby reducing evaporation to a minimum.

The Refuge was in a much better position to properly utilize the water received this season than heretofore, because of the control facilities constructed during the past year for the distribution of the water on the area. With the passing of another year, additional progress in this respect will undoubtedly be recorded.

PUBLIC RELATIONS AT MALHEUR REFUGE A MAJOR ACTIVITY

Public relations work on the part of the Refuge personnel is fast becoming one of the major activities at this location. As a policy, every opportunity has been taken to acquaint the public with our development program, the purpose and functions of Malheur Refuge, and its part in the national system of Refuges.

The past year has shown much progress locally in stimulating interest in our work. The general attitude of residents of Harney County toward the project has noticeably improved, and the Refuge is enjoying the wholehearted backing of many local civic organizations.

The Refuge has been visited during the past year by many more people of diversified interests than ever before. Motor-logue parties from several outside locations have inspected the project. The American Automobile Association sponsored a tour of this region, which resulted in an exceptionally interesting illustrated feature article being published in the Sunday Oregonian, a Portland publication. A tour official of the Gilmore Oil Company made a two-day visit to Malheur Refuge and succeeded in placing publicity features in the San Francisco Chronicle and the Oregon Journal at Portland. A staff photographer of the Oregonian consumed a day on the Refuge with his cameras, and the resulting pictorial review published in that paper included scenes from the Malheur Refuge.

Sportsmen's organizations from many different locations have either already inspected the Refuge or have communicated with the local administration relative to proposed trips through the area.

Interested conservationists have come great distances to view the Malheur Refuge and its wildlife, while visiting tourists have increased to the point of necessitating almost daily attention from Refuge personnel.